

CLAIMS

What is claimed is:

- 1 1. A method for managing a network, the network including a plurality of network
2 elements that are configured to be interconnected to one another, the method
3 comprising:
4 receiving information about a link state for each network element in the plurality of
5 network elements ;
6 determining whether any of the plurality of network elements are unreachable, based
7 on the link state information; and
8 configuring a management policy for at least one of the network elements, the
9 management policy identifying if any of the plurality of network elements are
10 determined as being unreachable.
- 1 2. The method of claim 1, wherein configuring a management policy includes
2 communicating with one or more of the network elements to account for any of the plurality
3 of network elements that were detected as being unreachable.
- 1 3. The method of claim 1, wherein configuring a management policy includes signaling
2 to an operator interface an indication that one or more network elements are unreachable.
- 1 4. The method of claim 1, further comprising updating a data structure that includes the
2 link state information for each network element in the plurality of network elements.
- 1 5. The method of claim 1, further comprising updating a data structure that includes the
2 link state information for each network element in the plurality of network elements by
3 receiving a broadcast from at least some of the plurality of network elements, the broadcast
4 from each network element containing information about the link state for each network
5 element in the plurality of network elements.

- 1 6. The method of claim 1, wherein configuring a management policy includes detecting
2 that at least one of the plurality of network elements is unreachable, and then identifying
3 which one of the network elements in the plurality of network elements are unreachable.
- 1 7. The method of claim 1, wherein configuring a management policy includes detecting
2 that at least one of the plurality of network elements is unreachable, and then polling one or
3 more selected network elements in the plurality of network elements to identify which one of
4 the plurality of network elements are unreachable.
- 1 8. The method of claim 1, wherein configuring a management policy includes
2 instructing a management device to configure the management policy for at least one
3 of the plurality of network elements.
- 1 9. The method of claim 1, wherein the link state information for each network element
2 describes a connection between that network element and at least one other network
3 element designated to be connected to that network element.
- 1 10. A method for managing a network, the network including a plurality of network
2 elements that are configured to be interconnected to one another, the network
3 including a management device to manage at least one of the network elements using
4 one or more policies, the plurality of network elements being in communication with
5 a first router that maintains link state information about the interconnectivity of the
6 plurality of network elements, the method comprising:
7 accessing the link state information from the first router, the link state information
8 describing a connection between each network element in the plurality of
9 network elements and at least one network element designated to be connected
10 to that network element; and

11 detecting if any of the plurality of network elements are unreachable for
12 communications with the management device using the link state information
13 from the first router.

1 11. The method of claim 10, further comprising configuring a management policy for the
2 plurality of network elements if one or more of the plurality of network elements are
3 detected to be unreachable.

1 12. The method of claim 10, wherein in response to detecting one or more network
2 elements are unreachable, the method comprises signaling an indication that one or
3 more elements are unreachable to an operator interface.

1 13. The method of claim 10, wherein detecting if any of the plurality of network elements
2 are unreachable for communications with the management device includes detecting
3 at least one of the plurality of network elements having a failure using the link state
4 information.

1 14. The method of claim 10, wherein accessing the link state information includes
2 declaring one of the plurality of interconnected elements as a second router to the first
3 router.

1 15. A method for managing a network, the network including a plurality of network
2 elements that are configured to be interconnected to one another, the network
3 including a management device to manage at least one of the network elements using
4 one or more policies, the method comprising:
5 operating the plurality of network elements using a link state protocol that causes link
6 state information to be generated; and
7 detecting if any of the network elements are unreachable using link state information
8 provided by the network elements operating the link state protocol.

- 1 16. The method of claim 15, further comprising configuring a management policy for at
2 least one of the network elements using the management device, the management policy
3 identifying if any of the plurality of network elements are detected as being unreachable.
- 1 17. The method of claim 15, further comprising communicating with one or more of the
2 network elements to implement a management policy that accounts for any of the plurality of
3 network elements that were detected as being unreachable.
- 1 18. The method of claim 15, further comprising signaling an indication to an operator
2 interface that one or more network elements are unreachable.
- 1 19. The method of claim 15, wherein detecting if any of the network elements are
2 unreachable includes detecting a break in the plurality of network elements being
3 interconnected to one another.
- 1 20. The method of claim 15, wherein detecting if any of the network elements are
2 unreachable includes detecting a break in the plurality of network elements being
3 interconnected to one another, and then communicating with each network element to
4 identify which one or more of the network elements are unreachable.
- 1 21. A method for managing a network, the network including a plurality of network
2 elements that are configured to be interconnected to one another, the method comprising:
3 receiving link state information automatically from the plurality of network elements
4 operating a link state protocol, the link state information from each network
5 element indicating a status of a connection with an adjacent network element
6 in the plurality of network elements; and
7 configuring a management policy for the plurality of network elements by
8 subsequently determining if one or more of the plurality of network elements
9 are reachable using the link state information

1 22. The method of claim 21, wherein operating the plurality of network elements includes
2 operating the plurality of network elements using an Open Shortest Path First (OSPF)
3 protocol.

1 23. The method of claim 21, wherein operating the plurality of network elements includes
2 operating the plurality of network elements using an Enhanced Internet Gateway Routing
3 Protocol (EIGRP) protocol.

1 24. The method of claim 21, further comprising determining routes for communication
2 packets to the plurality of network elements using the link state information.

1 25. A computer system for managing a network, the network including a plurality of
2 network elements, the computer system comprising:
3 a processor;
4 a network interface to receive link state information for the plurality of network
5 elements; and
6 a storage medium coupleable to the processor, the storage medium carrying
7 instructions for:
8 determining whether any of the plurality of network elements are
9 unreachable, based on the link state information, and
10 for configuring a management policy for at least one of the network elements,
11 the management policy identifying if any of the plurality of network
12 elements are determined as being unreachable.

1 26. The computer system of claim 25, wherein the instructions for configuring a
2 management policy includes instructions for communicating with one or more of the
3 network elements to account for any of the plurality of network elements that were
4 detected as being unreachable.

106290-035560

- 1 27. The computer system of claim 25, wherein the instructions for configuring a
2 management policy includes instructions for signaling to an operator interface an
3 indication that one or more network elements are unreachable .
- 1 28. The computer system of claim 25, wherein the storage medium carries instructions for
2 updating a data structure that includes link state information for each network element
3 in the plurality of network elements.
- 1 29. A computer-readable medium for managing a network, the network including a
2 plurality of network elements that are configured to be interconnected to one another,
3 the computer-readable medium carrying instructions for performing:
4 receiving information about a link state for each network element in the plurality of
5 network elements ;
6 determining whether any of the plurality of network elements are unreachable, based
7 on the link state information; and
8 configuring a management policy for at least one of the network elements, the
9 management policy identifying if any of the plurality of network elements are
10 detected as being unreachable.
11

1 30. The computer-readable medium of claim 29, wherein the computer-readable medium
2 includes instructions for communicating with one or more of the network elements to
3 account for any of the plurality of network elements that were detected as being
4 unreachable.

1 31. The computer-readable medium of claim 29, wherein instructions for configuring a
2 management policy include instructions for signaling to an operator interface an
3 indication that one or more network elements are unreachable

1 32. The computer-readable medium of claim 29, wherein the computer-readable medium
2 includes instructions for updating a data structure that includes the link state
3 information for each network element in the plurality of network elements. .

1 33. The computer-readable medium of claim 29, wherein the computer-readable medium
2 includes instructions for updating a data structure that includes the link state
3 information for each network element in the plurality of network elements by
4 receiving a broadcast from at least some of the plurality of network elements, the
5 broadcast from each network element containing information about the link state for
6 each network element in the plurality of network elements.

1 34. The computer-readable medium of claim 29, wherein instructions for configuring a
2 management policy includes instructions for detecting that at least one of the plurality
3 of network elements is unreachable, and then identifying which one of the network
4 elements in the plurality of network elements are unreachable

1 35. The computer-readable medium of claim 29, wherein instructions for configuring a
2 management policy include instructions detecting that at least one of the plurality of
3 network elements is unreachable, and then polling one or more selected network
4 elements in the plurality of network elements to identify which one of the plurality of
5 network elements are unreachable

1 36. A computer system for managing a network, the network including a plurality of
2 network elements that are configured to be interconnected to one another, the
3 computer system comprising:
4 means for receiving information about a link state for each network element in the
5 plurality of network elements;
6 determining whether any of the plurality of network elements are unreachable, based
7 on the link state information; and
8 means for configuring a management policy for at least one of the network elements,
9 the management policy identifying if any of the plurality of network elements
10 are detected as being unreachable.